

Table 1

Layer		Thickness	Carrier concentration (cm ⁻³)
p-Al _{0.07} Ga _{0.93} N cladding layer	1 0 6	0.5μm	5 x 10 ¹⁷
undoped In _{0.1} Ga _{0.9} N/In _{0.02} Ga _{0.98} N triple quantum wells	1 0 5	well 4nm/barrier 4nm	
n-Al _{0.07} Ga _{0.93} N cladding layer	1 0 4	1μm	5 x 10 ¹⁷
n-GaN base layer	1 0 3	4μm	1 x 10 ¹⁸
undoped AlN initial layer	1 0 2	380nm	
SiC substrate	1 0 1		

Table 2

	SiC substrate	overgrown AlN layer	poly-type matching	crystal quality	device performance
This invention	4H- a-face	4H- a-face	Yes	Excellent	Good
compared example	6H- a-face	2H- a-face	No	Poor	Bad

Table 3

Layer		Thickness	Carrier concentration (cm ⁻³)
p-Al _{0.07} Ga _{0.93} N cladding layer	1 2 0 7	0.5μm	5 x 10 ¹⁷
undoped In _{0.1} Ga _{0.9} N/In _{0.02} Ga _{0.98} N triple quantum wells	1 2 0 6	well 4nm/barrier 4nm	
n-Al _{0.07} Ga _{0.93} N cladding layer	1 2 0 5	1μm	5 x 10 ¹⁷
n-GaN base layer	1 2 0 4	4μm	1 x 10 ¹⁸
n-GaN seed layer	1 2 0 3	1μm	1 x 10 ¹⁸
undoped AlN initial layer	1 2 0 2	380nm	
SiC substrate	1 2 0 1		

Table 4

(a) on n-type 4H-SiC(11-20)

Layer	Thickness	Carrier concentration (cm ⁻³)
p-Al _{0.07} Ga _{0.93} N cladding layer 1 3 0 4	0.5μm	5 x 10 ¹⁷
undoped In _{0.1} Ga _{0.9} N/In _{0.02} Ga _{0.98} N triple quantum wells 1 3 0 3	well 4nm/barrier 4nm	
n-Al _{0.07} Ga _{0.93} N cladding layer 1 3 0 2	1μm	1 x 10 ¹⁸
n-Al _{0.5} Ga _{0.5} N initial layer	380nm	1 x 10 ¹⁸
SiC substrate 1 3 0 1		

(b) on p-type 4H-SiC(11-20)

Layer	Thickness	Carrier concentration (cm ⁻³)
n-Al _{0.07} Ga _{0.93} N cladding layer 1 3 0 2	0.5μm	5 x 10 ¹⁷
undoped In _{0.1} Ga _{0.9} N/In _{0.02} Ga _{0.98} N triple quantum wells 1 3 0 3	well 4nm/barrier 4nm	
p-Al _{0.07} Ga _{0.93} N cladding layer 1 3 0 4	1μm	1 x 10 ¹⁸
p-Al _{0.5} Ga _{0.5} N initial layer	380nm	1 x 10 ¹⁸
SiC substrate 1 3 0 9		

Table 5

(a) on n-type 4H-SiC(11-20)

Layer	Thickness	Carrier concentration (cm ⁻³)
p-GaN contact layer 1 4 0 5	5nm	1×10^{18}
p-Al _{0.25} Ga _{0.75} N cladding layer 1 4 0 4	0.5μm	5×10^{17}
undoped In _{0.02} Al _{0.15} Ga _{0.85} N/Al _{0.15} Ga _{0.85} N triple quantum wells 1 4 0 3	well 2nm/barrier 5nm	
n-Al _{0.25} Ga _{0.75} N cladding layer 1 4 0 2	1μm	5×10^{17}
n-Al _{0.5} Ga _{0.5} N initial layer	380nm	1×10^{18}
SiC substrate 1 4 0 1		

(b) on p-type 4H-SiC(11-20)

Layer	Thickness	Carrier concentration (cm ⁻³)
n-Al _{0.25} Ga _{0.75} N cladding layer 1 4 0 2	0.5μm	5×10^{17}
undoped In _{0.02} Al _{0.15} Ga _{0.85} N/Al _{0.15} Ga _{0.85} N triple quantum wells 1 4 0 3	well 2nm/barrier 5nm	
p-Al _{0.25} Ga _{0.75} N cladding layer 1 4 0 4	1μm	5×10^{17}
p-Al _{0.5} Ga _{0.5} N initial layer	380nm	1×10^{18}
SiC substrate 1 4 0 9		

Table 6

Layer		Thickness	Carrier concentration (cm ⁻³)
n-Al _{0.25} Ga _{0.75} N layer	1 5 0 5	15nm	2 x 10 ¹⁸
undoped Al _{0.25} Ga _{0.75} N layer	1 5 0 4	5nm	
undoped GaN layer	1 5 0 3	4μm	
undoped AlN initial layer	1 5 0 2	380nm	
SiC substrate	1 5 0 1		